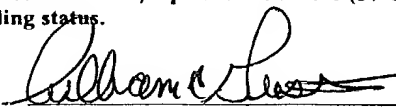


410 Rec'd PCT/PTO 18 MAY 2000

FORM PTO-1390 (REV 12-29-99)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER	
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371				METAL 1278-WCG	
				U.S. APPLICATION NO (If known, see 37 CFR 1.5) 09/554781	
INTERNATIONAL APPLICATION NO. PCT/EP98/07619		INTERNATIONAL FILING DATE 26 November 1998 (26.11.98)		PRIORITY DATE CLAIMED 27 November 1997 (27.11.97)	
TITLE OF INVENTION SLAG CRUSHER					
APPLICANT(S) FOR DO/EO/US Wolfram GRUHLKE, Hans-Otto RAMM					
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:					
<p>1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.</p> <p>2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.</p> <p>3. <input checked="" type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).</p> <p>4. <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.</p> <p>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2))</p> <p style="margin-left: 20px;">a. <input type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau).</p> <p style="margin-left: 20px;">b. <input checked="" type="checkbox"/> has been transmitted by the International Bureau.</p> <p style="margin-left: 20px;">c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</p> <p>6. <input checked="" type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)).</p> <p>7. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))</p> <p style="margin-left: 20px;">a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau).</p> <p style="margin-left: 20px;">b. <input type="checkbox"/> have been transmitted by the International Bureau.</p> <p style="margin-left: 20px;">c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</p> <p style="margin-left: 20px;">d. <input type="checkbox"/> have not been made and will not be made.</p> <p>8. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</p> <p>9. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).</p> <p>10. <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</p> <p>Items 11. to 16. below concern document(s) or information included:</p> <p>11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</p> <p>12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</p> <p>13. <input type="checkbox"/> A FIRST preliminary amendment.</p> <p style="margin-left: 20px;"><input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.</p> <p>14. <input type="checkbox"/> A substitute specification.</p> <p>15. <input type="checkbox"/> A change of power of attorney and/or address letter.</p> <p>16. <input checked="" type="checkbox"/> Other items or information:</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>a) International Search Report (in German);</p> <p>b) English translation of International Search Report;</p> <p>c) written communication (in German);</p> <p>d) English translation of written communication;</p> <p>e) International Preliminary Examination Report, with annex (in German);</p> <p>f) English translation of International Preliminary Examination Report, with annex;</p> <p>g) original request;</p> <p>h) published application (WO 99/28413).</p> </div> <div style="width: 48%;"> <p>i) certified copy of Priority Document;</p> <p>j) 5 sheets of drawings (attached to English translation);</p> <p>k) letter to Official Draftsman</p> </div> </div>					

422 Rec'd PCT/PTO 18 MAY 2000

U.S. APPLICATION NO. (US Patent, 37 CFR 1.51) 09/554781		INTERNATIONAL APPLICATION NO.		ATTORNEY'S DOCKET NUMBER	
17. <input checked="" type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) : Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$970.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$840.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$690.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$670.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) \$96.00 ENTER APPROPRIATE BASIC FEE AMOUNT =				CALCULATIONS PTO USE ONLY	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	5 - 20 =	0	X \$18.00	\$ 0	
Independent claims	1 - 3 =	0	X \$78.00	\$ 0	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			0	+ \$260.00	\$ 0
TOTAL OF ABOVE CALCULATIONS =				\$ 840.00	
Reduction of 1/2 for filing by small entity, if applicable. A Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28).				\$	
SUBTOTAL =				\$	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$	
TOTAL NATIONAL FEE =				\$ 840.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property				\$	
TOTAL FEES ENCLOSED =				\$ 840.00	
				Amount to be:	\$
				refunded	
				charged	\$
a. <input type="checkbox"/> A check in the amount of \$_____ to cover the above fees is enclosed.					
b. <input checked="" type="checkbox"/> Please charge my Deposit Account No. <u>14-1263</u> in the amount of \$ <u>840.00</u> to cover the above fees. A duplicate copy of this sheet is enclosed.					
c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>14-1263</u> . A duplicate copy of this sheet is enclosed.					
NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.					
SEND ALL CORRESPONDENCE TO NORRIS, McLAUGHLIN & MARCUS, P.A. 660 White Plains Road Tarrytown, New York 10591					
				 SIGNATURE:	
				William C. Gerstenzang NAME	
				<u>27,552</u> REGISTRATION NUMBER	

~~5/17/00~~
422 Rec'd PCT/PTO 18 MAY 2000

METAL 1278-WCG
98 00 79 US/A 7883

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants : Wolfram GRUHLKE, Hans-Otto RAMM
Serial No. : To Be Assigned
Filed : Herewith
For : SLAG CRUSHER
Art Unit : To Be Assigned
Examiner : To Be Assigned

May 17, 2000

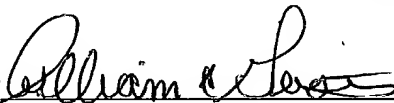
BOX PCT
The Assistant Commissioner
for Patents
Washington, D. C. 20231

Sir:

LETTER TO THE OFFICIAL DRAFTSMAN

Submitted herewith for entry and approval is five (5) sheets of corrected formal drawings in the above-referenced application.

Respectfully submitted,
NORRIS, McLAUGHLIN & MARCUS, P.A.

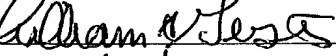
By 
William C. Gerstenzang
Reg. No. 27,552

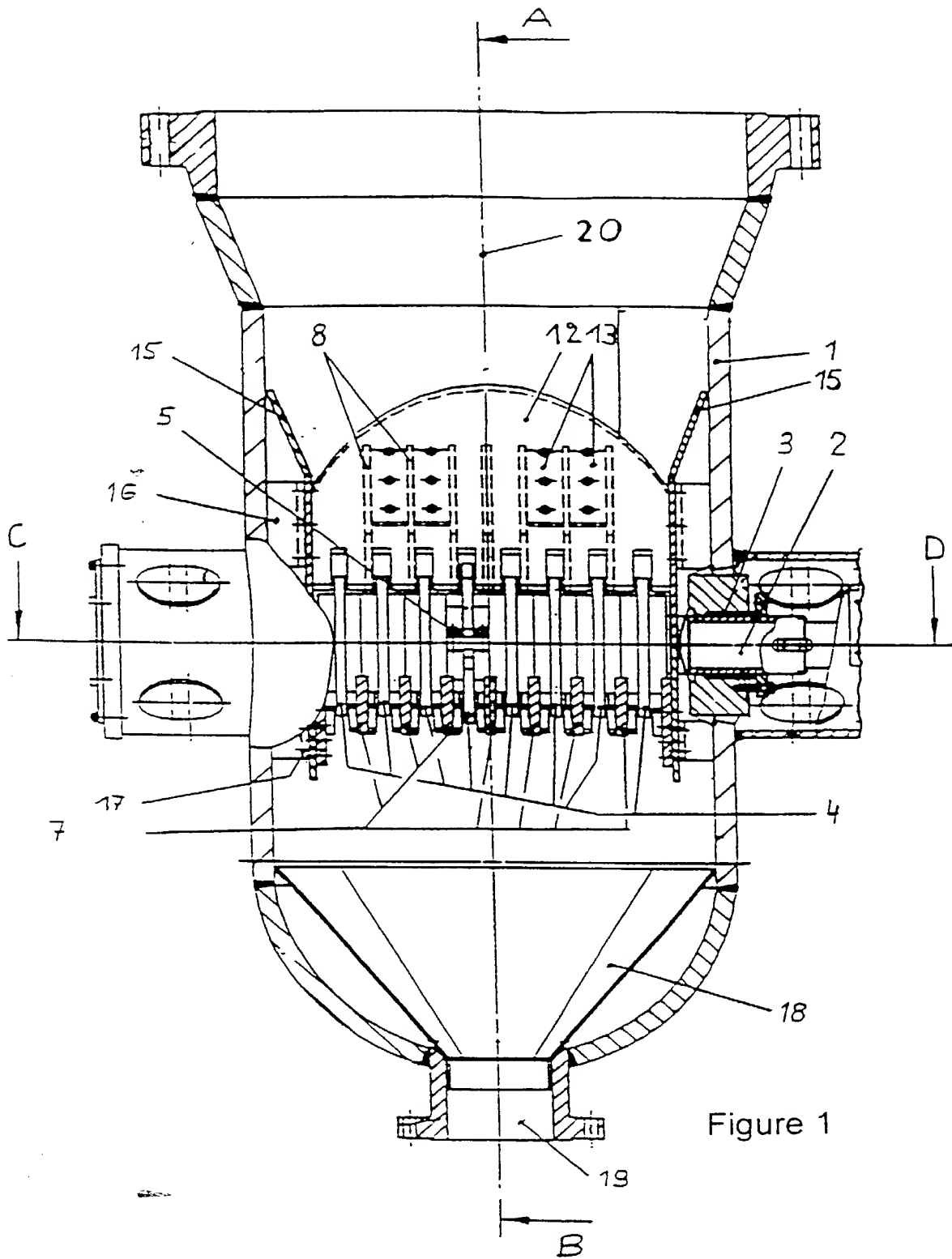
WCG:ks

660 White Plains Road
Tarrytown, New York 10591-5144
(914)332-1700

I hereby certify that this correspondence is being deposited with the United States Postal Services as Express Mail in an envelope addressed to The Assistant Commissioner for Patents, Washington, D.C. 20231 on May 17, 2000.

NORRIS, McLAUGHLIN & MARCUS, P.A.

By 
Date 5/17/00



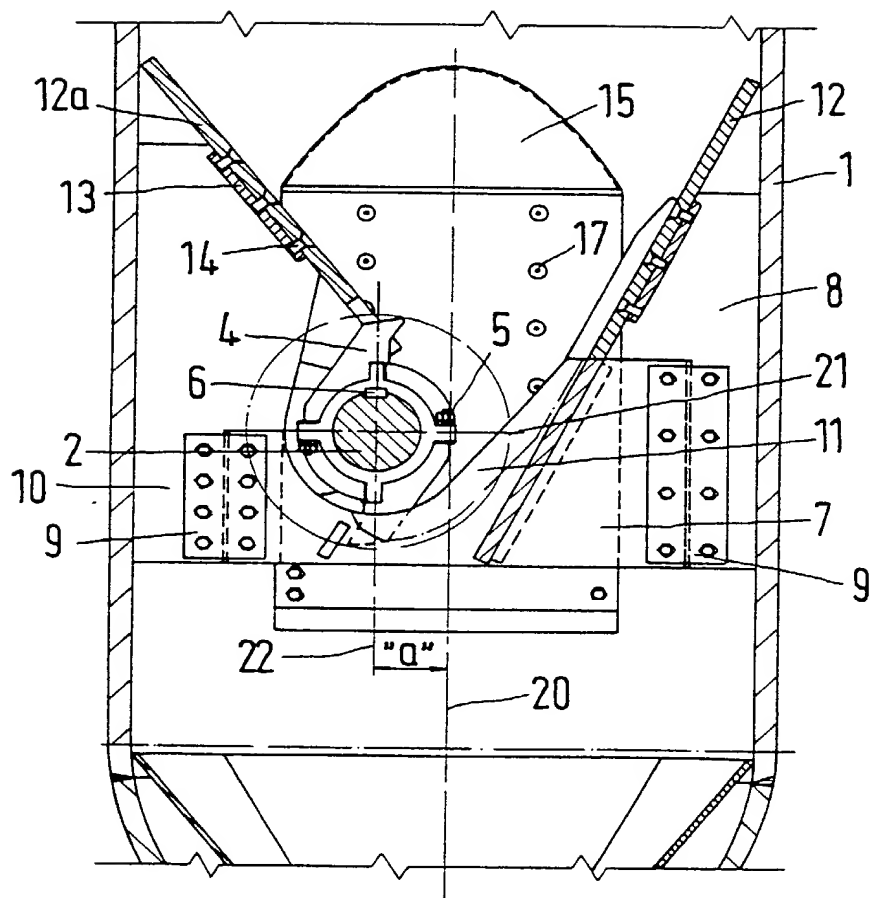
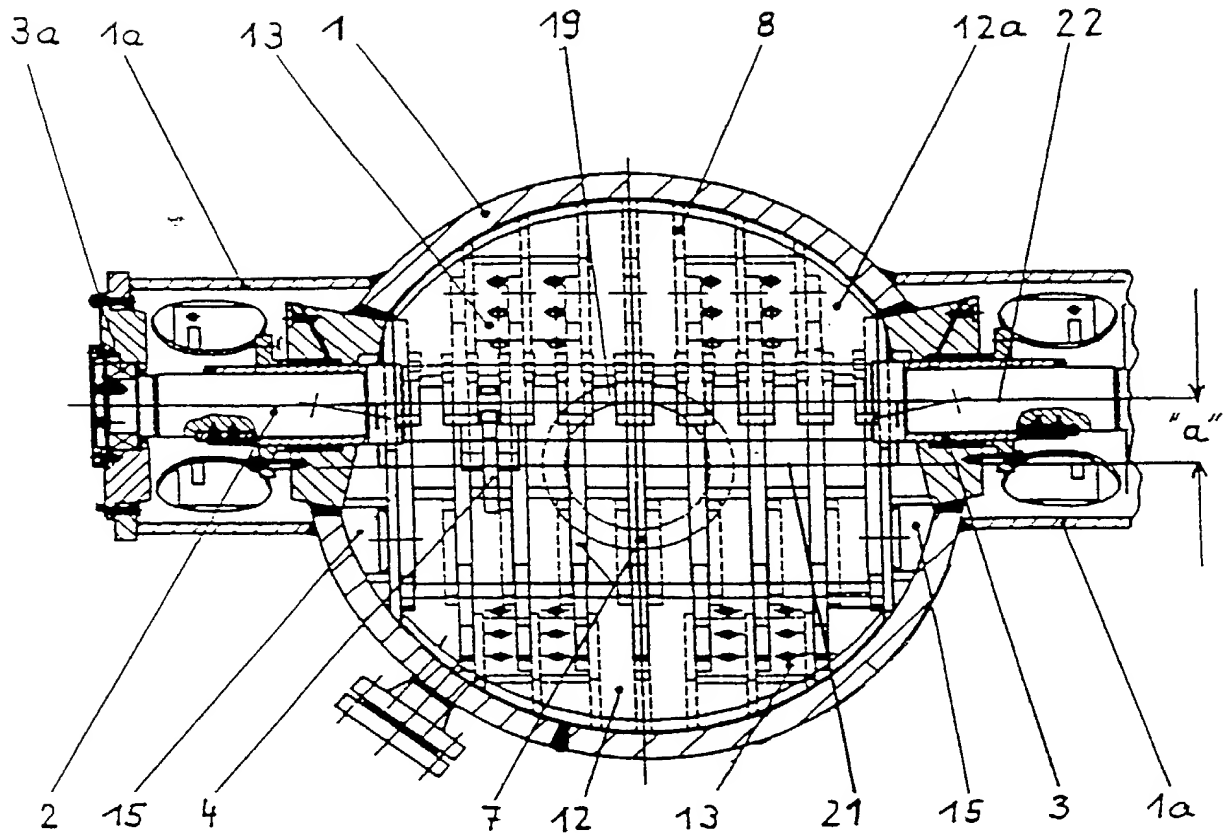
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Figure 2



Section C - D

Figure 3

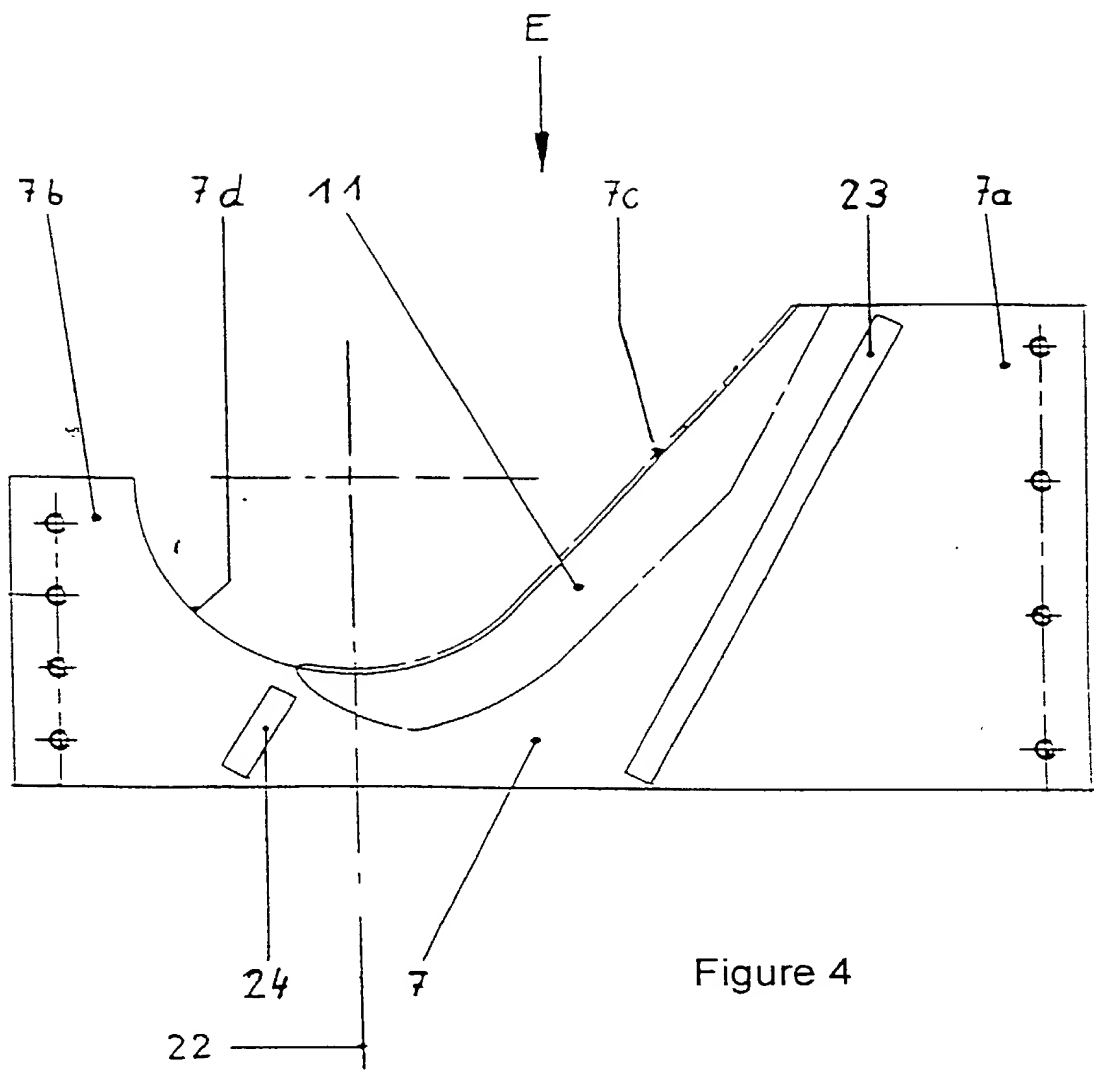


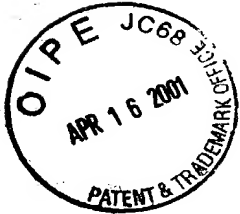
Figure 4

09/554781



Figure 5

Translation of PCT/EP98/07619



Slag Crusher

Description

This invention relates to a slag crusher at the outlet of a radiation cooler or gasification reactor with quenching section, comprising a flooded pressure housing as well as a shaft extending through the housing and comprising rotating cutting knives, inlet baffle plates in a funnel-shaped arrangement, and stationary cutting knives.

Slag crushers are used for crushing lumpy mineral slags and unburnt residues, as they are produced in combustion processes or in the gasification of coal.

From DE 42 20 265 C1 there is known an apparatus for producing gas to be used in firing plants.

The apparatus comprises a reactor housing that is water-cooled with respect to its wall portions. Inside the reactor housing there is disposed a stepped reactor bottom carrying the material to be gasified, which reactor bottom is divided into several stationary portions and between the same into incorporated movable portions. Supply lines for the gasifica-

- 2 -

tion medium are associated to the movable portions. In direction of movement of the material to be gasified behind the reactor bottom there is provided an ash discharge including a discharge worm having crushing elements. Above the lower end of the reactor bottom there is provided a water-cooled rotating slag crusher with water-cooled crushing teeth provided on its periphery. Below the lower end of the reactor bottom there is disposed an ash collecting chamber with a discharge worm which likewise has crushing elements on its periphery.

In the case of a slag crusher developed by the applicants for oil or coal gasification plants, which is disposed at the outlet of a radiation cooler or a gasification reactor with chilling or quenching section, the crushing operation takes place in a water bath under the process pressure. Corresponding to the process conditions, the housing of the slag crusher is pressure-proof. The passage of the drive shaft of the cutting knives through the pressure housing has been effected by means of a pressure-tight stuffing box sealing system with sealing water.

The actual crushing operation inside the pressure housing is performed by rotating cutting knives. The stationary cutting knives serve as shoulder or thrust bearing when crushing the large slag lumps by means of the knives disposed on a rotating shaft.

A disadvantage of this slag crusher is the centric arrangement of the shaft in the pressure housing with the rotating knives between the radial and axial inlet baffle plates disposed on both sides and the stationary knives disposed on one side of the radial baffle plates.

The uncrushed and too large slag lumps pile up above the rotating knives and are again and again pushed upwards through the too small opening between the baffle plates provided on

both sides and are not supplied to the knives. There is a pile-up of material above the rotating shaft, which leads to an interruption of the flow of material and impairs a controlled crushing and removal of slag.

It is therefore the object underlying the invention to arrange the cutting tools such that both small and large slag pieces are seized completely and a controlled crushing and removal of the slag from the slag crusher is effected.

The solution of the object is effected in accordance with the main claim; the sub-claims represent advantageous aspects of the invention.

Due to the inventive arrangement and design of the rotating and stationary knives a controlled supply of material to the crushing points is ensured. By means of the arrangement and allocation of the cutting and stationary knives and their distances from each other a good crushing result and a high crushing efficiency are achieved.

The stationary cutting knives have a long leg and a short leg. Into the stationary cutting knife a circular recess verging into a straight line has been made on the side of the long leg, and on the side of the short leg only a circular recess has been made, based on the vertical center line of the pressure vessel.

The stationary cutting knives are releasably mounted on brackets inside the pressure vessel; the dimensions of the long and short legs depend on the location of the stationary knife with respect to the outer wall of the pressure vessel, where the length of each stationary knife depends on the arrangement with respect to the center line and on the arrangement with respect to the round wall of the pressure vessel in the cutting position inside the pressure vessel.

Both the cutting and the stationary knives are exposed to an enormous wear in the cutting area. Therefore, these areas are provided with a wear protection. This wear protection can be achieved by means of a build-up weld or a mechanically applied wear protection. Of course, all knives can also be replaced as a complete unit, when a prolonged wearing operation has lead to a wear of the knife bodies.

The passages of the drive shaft through the pressure vessel are sealed by means of special stuffing boxes with a lubricating or rinsing system. The support and the drive of the drive shaft are disposed outside the pressure vessel. The shaft extending through the pressure vessel is disposed at a distance "a" from the vertical or horizontal center line.

The invention will now be explained in detail with reference to an embodiment, wherein:

Fig. 1 shows a vertical section through a slag crusher in the sectional plane of the drive shaft,

Fig. 2 shows a section A - B through the slag crusher,

Fig. 3 shows a horizontal section C - D through the slag crusher in the sectional plane of the drive shaft,

Fig. 4 shows a side view of a stationary cutting knife,

Fig. 5 shows a view E of a stationary cutting knife.

As is represented in Fig. 1 and Fig. 2, the slag crusher consists of the pressure vessel 1, the drive shaft 2, stuffing boxes 3 provided on both sides, the rotating knives 4 mounted on the shaft as well as the stationary knives 7 disposed below/between the inlet baffle plates 12, 12a and the baffle plates of the feeding hopper 12, 15. The material to be

crushed is supplied to the crushing area via the baffle plates of the feeding hopper 12, 15.

In accordance with Fig. 2, the drive shaft 2 is disposed eccentrically or off-center at a distance "a" from the vertical center line 20 of the slag crusher, so that the crushing area is concentrated in the middle of the slag crusher. In this way, a uniform load of the fixture 5 of the rotating knives 4 is achieved as well as a central discharge of the crushed material.

On the drive shaft 2, which is passed through the pressure vessel 1 by means of a stuffing box sealing 3, the rotating cutting knives 4 are disposed. As a halved version, the rotating cutting knives 4 are fixedly connected with the drive shaft 2 by means of fastening screws 5 and a feather key 6. When crushing the material to be crushed, the crushing shoulders of the rotating cutting knives 4 form the stationary cutting knives 7 protruding through the inlet baffle plate 12, which stationary cutting knives are provided with a wear-resistant build-up weld 11. They are each mounted individually on mounting brackets 8, 10 by means of fastening screws 9.

The rotating cutting knives 4 are angularly offset in a known manner on the periphery of the shaft 2, so that it is achieved that during the crushing operation only one rotating knife 4 and two stationary knives 7 are each in engagement with each other as crushing shoulder or pairs of knives 7, and the further knives 4 are used only subsequently. When designing the motor, the crushing force of only one rotating cutting knife 4 should therefore be considered.

An essential feature of the inventive apparatus consists in that all interior cutting members 4, 7, which are exposed to wear, can quickly be replaced if necessary.

The crushed material is discharged from the slag crusher via the cone 18 and the outlet port 19 and supplied to a disposal site.

Fig. 3 shows a horizontal section C - D through the slag crusher in the sectional plane of the drive shaft 2. The drive shaft 2 is supported in two lateral ports 1a in roller bearings 3a and secured against escaping pressurized water by means of sealing elements 3.

The shaft 2 with the rotating cutting knives 4 is disposed inside the pressure housing 1 off-center or eccentrically at a distance "a" from the horizontal center line 21 of the pressure vessel 1.

The stationary cutting knives 7 are provided in slots of the inlet baffle plates 12, which in turn are mounted at brackets 8 and 13. In the vicinity of the sealing 3 near the wall of the housing 1 there are provided inlet baffle plates 15 off-set by 90°. The inlet baffle plates 12 and 15 form the so-called feeding or material hopper for the cutting knives 4, 7.

Fig. 4 shows a side view E of a stationary cutting knife 7 with a long leg 7a and a short leg 7b, which on the first-mentioned side 7a has a circular recess 7d verging into a straight line 7c, and on the last-mentioned side 7b only has a circular recess 7d, based on the vertical center line 22 of the shaft 2.

On both legs 7a, 7b guiding strips 23, 24 are provided. The straight portion 7c of the stationary cutting knife 7 is provided on its reverse side with a build-up weld or wear-resistant coating 11.

Fig. 5 shows a view E of the stationary cutting knife 7 with a long leg 7a and a short leg 7b, based on the horizontal center line 21 of the shaft 2. On both sides of the stationary cutting knives 7 guiding strips 23, 24 are provided.

List of Reference Numerals:

- 1 pressure housing
- 1a port
- 2 shaft
- 3 sealing
- 3a roller bearing
- 4 rotating cutting knife
- 5 fixture of the rotating cutting knife
- 6 feather key
- 7 stationary cutting knife
- 7a long leg
- 7b short leg
- 7c straight portion
- 7d circular recess
- 8 mounting bracket for stationary cutting knives
- 9 fastening means
- 10 mounting bracket for stationary cutting knives
- 11 build-up weld/wear-resistant coatings
- 12 inlet baffle plate
- 12a slotted inlet baffle plate
- 13 mounting bracket for inlet baffle plate
- 14 fastening screws
- 15 inlet baffle plate
- 16 mounting bracket for inlet baffle plate
- 17 fastening screws
- 18 cone
- 19 slag crusher outlet
- 20 vertical center line of 1
- 21 horizontal center line of 1
- 22 vertical center line of 2
- 23 guiding strips
- 24 guiding strips

"a" distance between 20 and 22

ART 34 AMDT

PCT/EP98/07619

New Claims

1. A slag crusher, comprising a pressure housing, a rotatable shaft extending through the pressure housing and including a plurality of cutting knives mounted thereon at a distance and rotating in operation, which cutting knives are mounted on the shaft so as to be angularly offset, comprising a plurality of stationary cutting knives disposed one beside the other below the shaft, where in the area of the crusher each rotating cutting knife extends between two adjacent stationary cutting knives, characterized in that in the pressure housing inclined inlet baffle plates are disposed and form an inlet funnel directed towards the area of the crusher, that the shaft is disposed at a distance (a) from the vertical center line of the pressure housing, that each stationary cutting knife is formed with a long leg (7a) and a short leg (7b) between a curved portion, and that the long leg is disposed in a slot of an inlet baffle plate.
2. The slag crusher as claimed in claim 1, characterized in that the rotating and the stationary cutting knives are releasably mounted.
3. The slag crusher as claimed in claim 1, characterized in that the rotating and the stationary cutting knives have wear-resistant coatings in the areas exposed to wear.

Abstract:

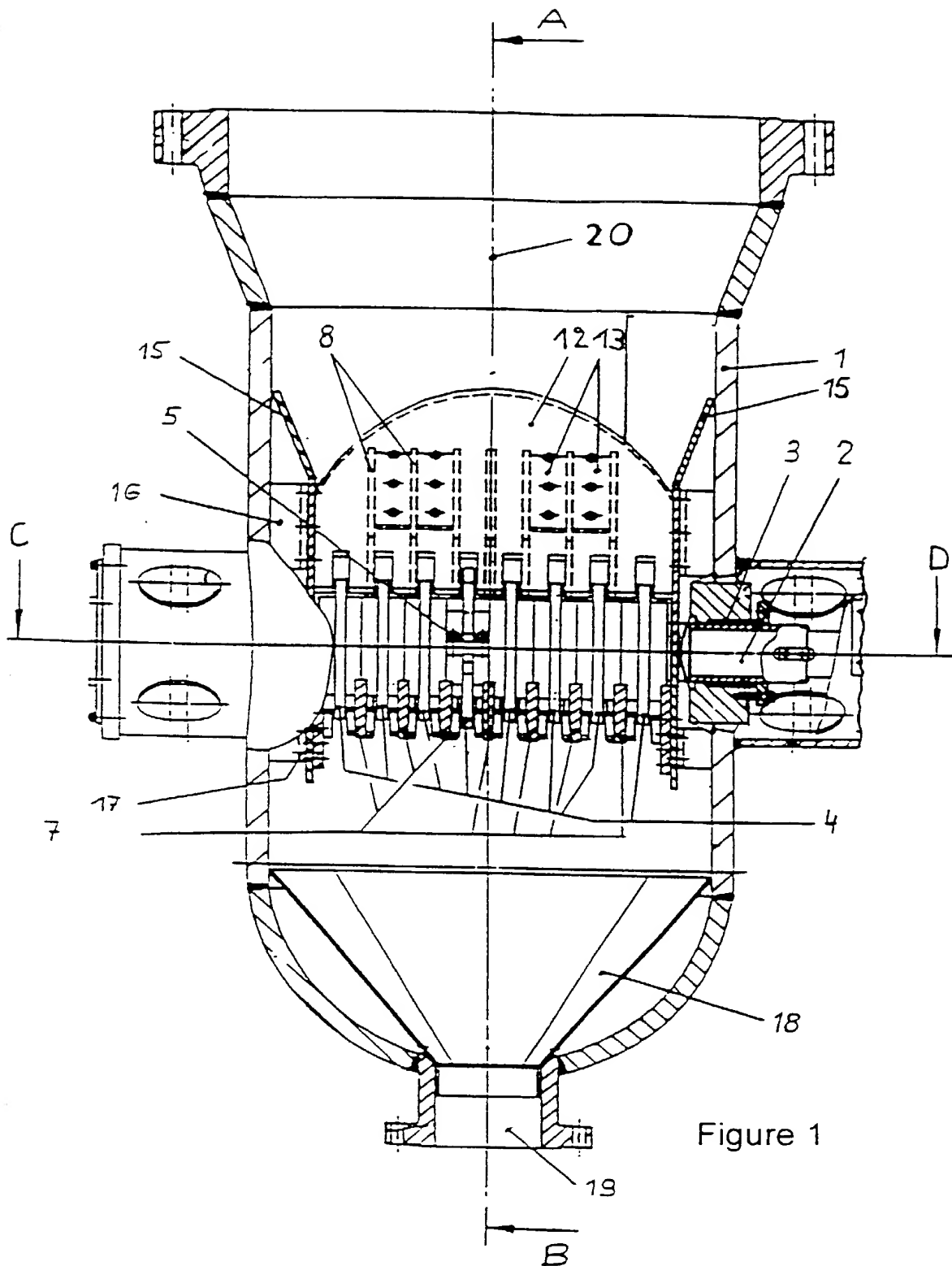
The invention relates to a slag crusher with a shaft (2) extending through the pressure housing (1), which shaft comprises inlet baffle plates (12, 15) in a funnel-shaped arrangement, stationary cutting knives (7) as well as cutting knives (4) rotating on the shaft (2).

The vertical center line (22) of the shaft (2) is disposed eccentrically or off-set with respect to the vertical center line (20) of the pressure housing (1) at a distance "a", so that the crushing area is concentrated in the middle of the slag crusher.

When crushing the material to be crushed, the crushing shoulders of the rotating cutting knives (4) form the stationary cutting knives (7) protruding through the inlet baffle plates (12, 12a), which stationary cutting knives are provided with a wear-resistant build-up weld (11) in the crushing area.

The rotating cutting knives (4) are angularly offset on the periphery of the shaft (2) in a known manner, so that it is achieved that during the crushing operation only one rotating knife (4) and two stationary knives (7) are each in engagement with each other, and the further knives (4) or pairs of knives (7) are used only subsequently.

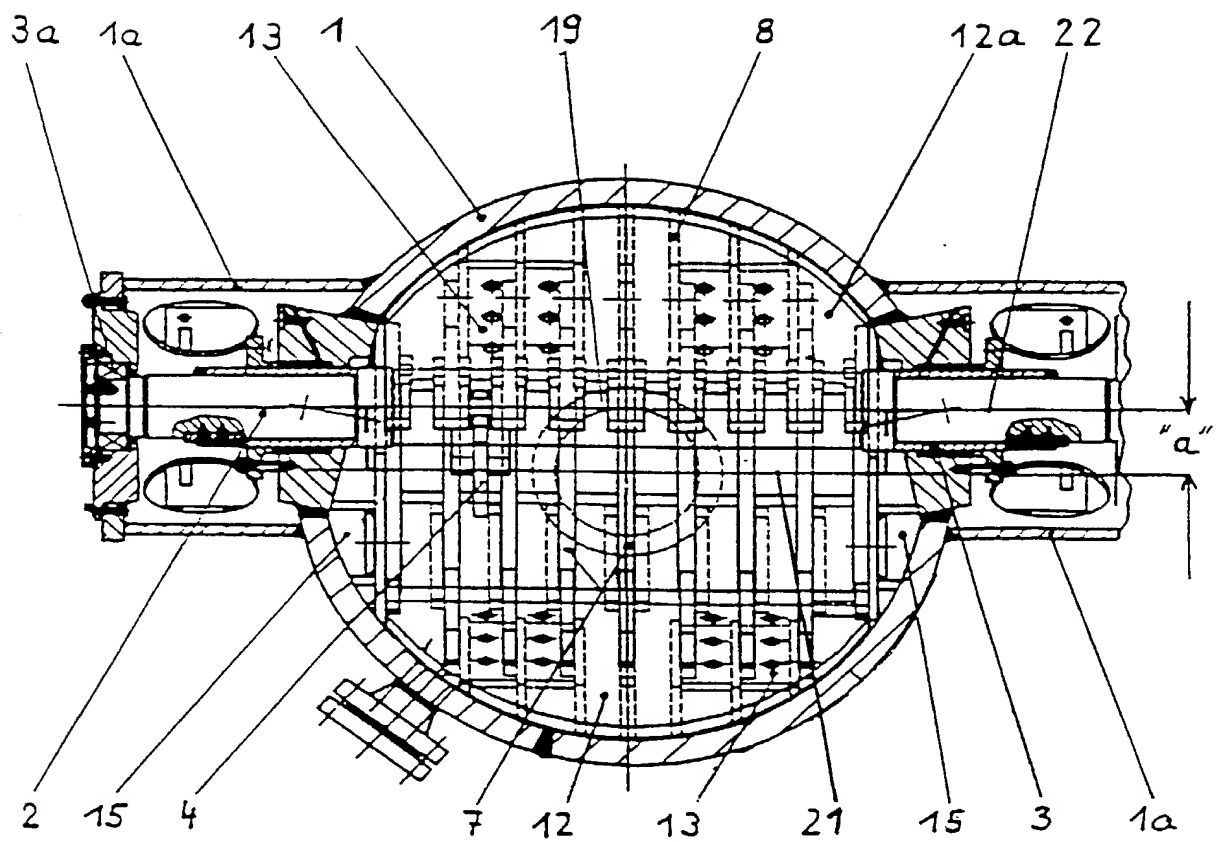
Fig. 2



1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2035-36	2036-37	2037-38	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	2052-53	2053-54	2054-55	2055-56	2056-57	2057-58	2058-59	2059-60	2060-61	2061-62	2062-63	2063-64	2064-65	2065-66	2066-67	2067-68	2068-69	2069-70	2070-71	2071-72	2072-73	2073-74	2074-75	2075-76	2076-77	2077-78	2078-79	2079-80	2080-81	2081-82	2082-83	2083-84	2084-85	2085-86	2086-87	2087-88	2088-89	2089-90	2090-91	2091-92	2092-93	2093-94	2094-95	2095-96	2096-97	2097-98	2098-99	2099-00	2100-01	2101-02	2102-03	2103-04	2104-05	2105-06	2106-07	2107-08	2108-09	2109-10	2110-11	2111-12	2112-13	2113-14	2114-15	2115-16	2116-17	2117-18	2118-19	2119-20	2120-21	2121-22	2122-23	2123-24	2124-25	2125-26	2126-27	2127-28	2128-29	2129-30	2130-31	2131-32	2132-33	2133-34	2134-35	2135-36	2136-37	2137-38	2138-39	2139-40	2140-41	2141-42	2142-43	2143-44	2144-45	2145-46	2146-47	2147-48	2148-49	2149-50	2150-51	2151-52	2152-53	2153-54	2154-55	2155-56	2156-57	2157-58	2158-59	2159-60	2160-61	2161-62	2162-63	2163-64	2164-65	2165-66	2166-67	2167-68	2168-69	2169-70	2170-71	2171-72	2172-73	2173-74	2174-75	2175-76	2176-77	2177-78	2178-79	2179-80	2180-81	2181-82	2182-83	2183-84	2184-85	2185-86	2186-87	2187-88	2188-89	2189-90	2190-91	2191-92	2192-93	2193-94	2194-95	2195-96	2196-97	2197-98	2198-99	2199-00	2200-01	2201-02	2202-03	2203-04	2204-05	2205-06	2206-07	2207-08	2208-09	2209-10	2210-11	2211-12	2212-13	2213-14	2214-15	2215-16	2216-17	2217-18	2218-19	2219-20	2220-21	2221-22	2222-23	2223-24	2224-25	2225-26	2226-27	2227-28	2228-29	2229-30	2230-31	2231-32	2232-33	2233-34	2234-35	2235-36	2236-37	2237-38	2238-39	2239-40	2240-41	2241-42	2242-43	2243-44	2244-45	2245-46	2246-47	2247-48	2248-49	2249-50	2250-51	2251-52	2252-53	2253-54	2254-55	2255-56	2256-57	2257-58	2258-59	2259-60	2260-61	2261-62	2262-63	2263-64	2264-65	2265-66	2266-67	2267-68	2268-69	2269-70	2270-71	2271-72	2272-73	2273-74	2274-75	2275-76	2276-77	2277-78	2278-79	2279-80	2280-81	2281-82	2282-83	2283-84	2284-85	2285-86	2286-87	2287-88	2288-89	228
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Figure 2



Section C - D

Figure 3

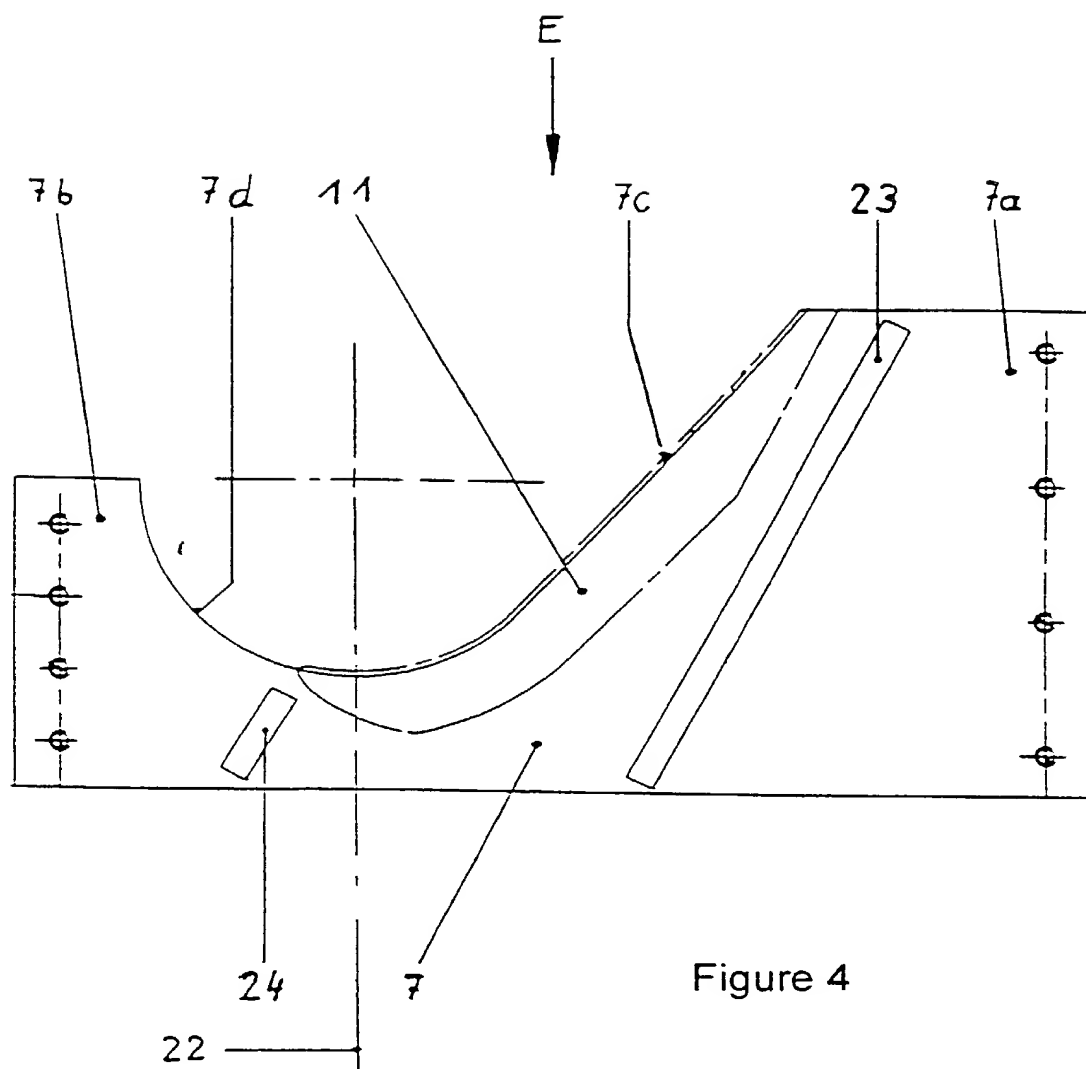
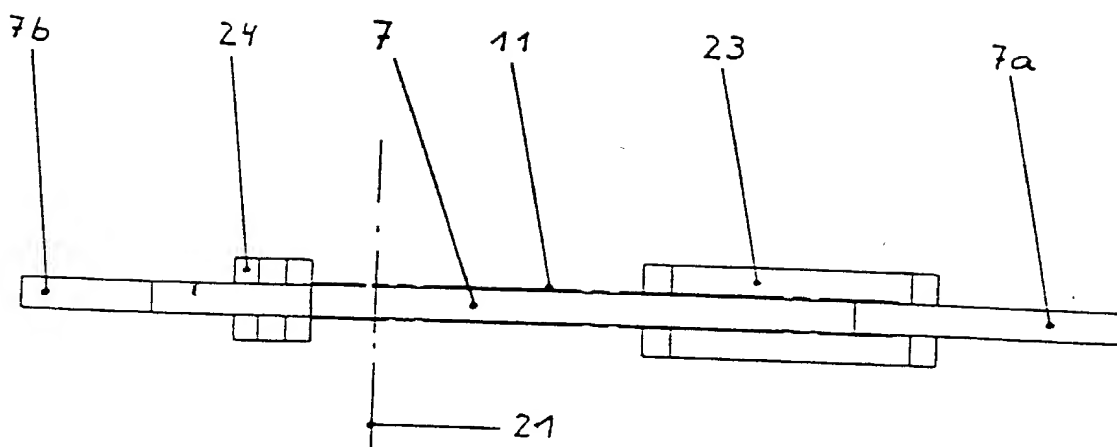


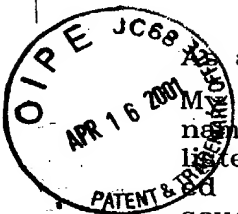
Figure 4



View E

Figure 5

COMBINED DECLARATION AND POWER OF ATTORNEY

ATTORNEY DOCKET NO
METAL 1278-WCG

I, a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name. I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

SLAG CRUSHER

the specification of which is attached hereto,

or was filed on May 18, 2000

as Application Serial No. 09/554,781.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s), the priority(ies) of which is/are to be claimed:

(Number)

(Country)

(Month/Day/Year Filed)

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose the material information as defined in Title 37, Code of Federal Regulations, §1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)

(Filing Date)

(Status)

(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

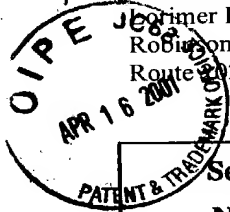
(Status)

(patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named Inventor, I hereby appoint the following attorneys and/or agents to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:

Kurt G. Briscoe, Reg. No. 33,141; William C. Gerstenzang, Reg. 27,552; Stephen G. Ryan, Reg. No. 39,015 and
 J. Homer P. Brooks, Reg. No. 15,155, all of 660 White Plains Road, Tarrytown, New York 10591, William R.
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Post Office Address			
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Residence		Citizenship	
Post Office Address			

Metal 1278.1-WCG
98 00 79 US/A 7883

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants : Wolfram GRUHLKE, et al.
Serial No. : 09/554,781
Filed : May 18, 2000
For : SLAG CRUSHER
Art Unit : To Be Assigned
Examiner : To Be Assigned

November 13, 2000

Hon. Assistant Commissioner
for Patents
Washington, D. C. 20231

NOTICE OF CHANGE OF FIRM ADDRESS

Sir:


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